Quervain, A. de. Die tiefste bisher beobachtete Temperatur der Atmosphäre. Pp. 279–280.

Busch, Fr. Der Bishop'sche Ring während der letzten atmosphärisch-optischen Störung, beobachtet zu Arnsberg. Pp. 280–282.

Busch, Fr. Niederschlag und Wasserführung der Flüsse Mitteleuropas. Pp. 282–284.

—— Gewitter und Kugelblitze in Krakau. P. 284.

Bemmelen, W. van. Messungen der lichtelektrischen Zerstreuung während der ringförmigen Sonnenfinsternis am 17. März 1904. Pp. 284–285.

Rudel, —. Unzuverlässigkeit des Gewitterregistrators. Pp. 285–286.

—— Kälte in der Sahara. P. 286.

—— Temperaturumkehrungen auf dem Ben Nevis. P. 286.

—— Blitzschlag in eine der Pyramiden. P. 286.

Hemel en Dampkring. Amsterdam. 3 Jahrgang.

Szalay, Ladislaus von. Over fotografiën van bliksemstralen. Pp. 19–23.

Hissink, C. W. Zodiakaallicht waargenomen te Zutphen, door C. W. Hissink, in het voorjaar van 1905. P. 24.

Nell, Chr. A. C. De halo's. Pp. 25–29.

Bolétim da Sociedade de Geographia de Lisboa. Lisboa. 23 série.

Osario, Augusto da Carvalho. Espectro de Brocken na Serra da Arrabida. P. 162.

Berthoud, Paul. Météorologie de Lourenço Marques. Pp. 163–164.

RECENT ADDITIONS TO THE WEATHER BUREAU LIBRARY.

R. A. EDWARDS, Acting Librarian.

The following titles have been selected from among the books recently received, as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies. Most of them can be loaned for a limited time to officials and employees who make application for them.

American Forest Congress.
Proceedings of the American Forest Congress. Held at Washington, D. C., January 2 to 6, 1905, under the auspices of the American Forestry Association. xi, 474 pp. 12°. Washington. 1805.

Baden. Centralbureau für Meteorologie und Hydrographie.
Deutsches Meteorologisches Jahrbuch für 1904. Baden. Sonderabdruck des II. Teiles des Jahresberichtes des Zentralbureaus für Meteorologie und Hydrographie für 1904. Bearbeitet von Prof. Dr. Ch. Schultheiss. 75 pp. f°. Karlsruhe. 1905.

France. Commission Météorologique de l'Hérault.
Bulletin Météorologique de l'Hérault. Année 1904. 132 pp. 4°. Montpellier. 1905.

France Commission Météorologique du Département de la Haute-Garonne.
Bulletin de la Commission Météorologique du Département de la Haute-Garonne. Tome I. Troisième fascicule 1903. 151–222+ 75–96 pp. 4°. Toulouse. 1904.

Great Britain. Meteorological Office.
Meteorological observations at stations of the second order for the year 1900. Published by direction of the Meteorological Council. xiii, 181 pp. f°. London. 1905.

Grenander, S.
Les gradients verticaux de la température dans les minima et les maxima barométriques. (Arkiv för matematik, astronomi och fysik utgivet af K. Svenska Vetenskapsakademien i Stockholm. Band 2. No. 7.) 15 pp. 8°. Upsala. 1905.

Hamburg. Deutsche Seewarte.
Deutsche überseeische meteorologische Beobachtungen. Heft XIII, 1905. Meteorologische Beobachtungen in Deutsch-Ost-Afrika. 317 pp. f°. n. p. n. d.

International Latitude Observatory of Mizusawa.
Annual report of the meteorological and the seismological observations made at the International Latitude Observatory of Mizusawa for the year 1904. 11 pp. f°. Mizusawa. 1905.

Japan. Cen ral Meteorological Observatory.
Annual report of the Central Meteorological Observatory of Japan for the year 1902. Part 1. Meteorological observations in Japan. 239 pp. 4°. Tokio. 1905.

Kremser, B.
Sonnenlose Tage. (Sonder-Abdruck aus "Das Wetter," Heft 5, 1905.) 7 pp. 8°.

Liverpool Observatory.
Report of the Director of the Observatory to the Marine Committee, and meteorological results deduced from the observations taken at the Liverpool Observatory, Bidston, Birkenhead, in the year 1904. 41 pp. 8°. Liverpool. 1905.

Meteorological Observatory, St. Ignatius College.
Tenth annual report of the Meteorological Observatory. 15 pp. 8°. Cleveland. 1904–1905.

Observatorio del Colegio de Belen.
Observaciones magneticas y meteorologicas hechas en el Observatorio del Colegio de Belen de la Compania de Jesus en la Habana. Ano de 1904. f°. Habana. 1905.

Physikalischer Verein zu Frankfurt am Main.
Jahresbericht des Physikalischen Vereins zu Frankfurt am Main für das Rechnungsjahr 1903–1904. 102 pp. 8°. Frankfurt am Main. 1905.

Prussia. Königliches Preussiches Meteorologisches Institut.
Ergebnisse der Niederschlags-Beobachtungen im Jahre 1901. Von G. Hellmann. Veröffentlichungen des Königlich Preussichen Meteorologischen Institute. Herausgegeben durch dessen Direktor Wilhelm von Bezold. lviii, 236 pp. f°. Berlin, 1905.

Russia. Meteorological Observatory of the Imperial Institute of Forestry at St. Petersburg.
Observations de l'Observatoire Météorologique de l'Institut Forestier Impériale à St. Petersbourg. 37 pp. f°. St. Petersburg. 1905.

Solar Physics Observatory.
Mean annual variations of barometric pressure and rainfall in certain regions. 16 pp. 17 plates. f°. London. 1905.
Solar Physics Observatory report, 1904. 41 pp. 8°. n. t. p.

Stacya Centralna Meteorologiczna przy Museum Przemyslu i
Rolnictwa w Warsawie, r. 1904. 30 pp. 4°. n. p. 1905.

Voeikov, Aleksander Ivanovich.
Les lacs du type polaire et les conditions de leur existence. (Extrait des Archives des Sciences Physiques et Naturelles. 4 pér. T. 16. Sept. 1903, p. 300 à 309.) 10 pp.
Einige Probleme der Seenkunde. (Aus: Zeitschrift für Gewässerkunde. 5 Band. Heft 1.) 15 pp.
Referate über russische Forschungen auf dem Gebiete der Meteorologie. (Separat-Abdruck aus der "Meteorologischen Zeitschrift," Heft 10, 1903.) Pp. 451–458.

Ward, Robert DeCourcy.
The climatic zones and their subdivisions. (Reprinted from Bulletin of the American Geographical Society, July, 1905.) 12 pp.

Wilson-Barker, D.
The connection of meteorology with other sciences. (From the Quarterly Journal of the Roy. Met. Soc. v. 31.) P. 85–95.

ANNUAL RINGS OF TREE GROWTH.

By Prof. E. E. BOGUE, Agricultural College, Lansing, Mich. Dated June 25, 1905.

I made an investigation of the seasonal and annual rapidity of growth of trees in Stillwater, Okla., covering the time from October 1, 1898, to September, 1901. Twenty-seven trees were carried through the entire time. Among them were five soft maples (*Acer saccharinum*) planted along the street for shade, and the rest were fruit trees and included varieties of plum, peach, cherry, apple, quince, pear, Russian mulberry, and apricot.

Nearly all the trees were yearlings, or two-year-olds, planted in the spring of 1898. The maximum growth was not the same for any two of the three seasons. The official meteorological station is about one-half mile from where the trees grow. There is no marked difference between the elevations of the two places nor any reason to suppose that the climate of the two places would vary. Table 1 gives the average increase in girth, expressed in millimeters, for the group of 27 trees during the respective months, as also the corresponding monthly rainfall, expressed in inches.

TABLE 1.—*Average increase in the girth of 27 trees, measured monthly at Stillwater, Okla.*

Months.	1898.		1899.		1900.		1901.	
	Rain.	Girth.	Rain.	Girth.	Rain.	Girth.	Rain.	Girth.
	Ins.	*mm.*	*Ins.*	*mm.*	*Ins.*	*mm.*	*Ins.*	*mm.*
January	.....	.....	0.48	—1.37	0.23	—0.22	0.62	—1.11
February	.....	.....	0.47	0.66	0.79	0.41	0.59	1.33
March	.....	.....	1.03	0.22	0.51	—0.15	2.95	0.55
April	.....	.....	4.97	1.70	4.43	6.18	1.29	3.63
May	.....	.....	5.61	13.33	3.71	18.51	5.70	15.51
June	.....	.....	3.64	20.20	3.28	20.60	0.79	11.60
July	.....	.....	4.45	20.25	2.69	15.10	1.48	9.33
August	.....	.....	2.57	10.44	1.39	5.10	1.95	4.33
September	.....	.....	0.88	5.11	9.22	6.40	.....	.....
October	4.19	4.74	5.15	1.37	2.87	1.59	.....	.....
November	0.68	0.89	1.93	—0.15	0.65	0.51	.....	.....
December	2.68	1.11	1.60	—0.74	0.21	—0.15	.....	.....
Annual total	.....	.....	32.78	81.02	29.98	73.88	.....	.....

It will be seen that the month of maximum rainfall is also the month of maximum growth. The two records for September show a deviation from the rule. October, 1898, shows a relation quite different from that of the same month in the other two years. It is not likely that the trees could use a high per cent of the abnormal precipitation for September, 1900. There was a distinct falling off in the growth for June, 1901, as compared with the same month in the other years, probably due to lack of rainfall during that month. The growth for May, 1901, as compared with the precipitation for that month can not be attributed to the heavy rainfall during the latter part of the previous month, because the records show that not more than an inch fell on any day, except the 10th, with 1.50, and the 28th, with 1.04.

TABLE 2.—*Rainfall and average width of annual rings of growth for 42 trees.*

	Year.												
	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.
Rain or melted snow in inches.....	29.92	31.29	19.30	22.80	35.20	33.61	31.72	23.67	31.62	32.49	38.50	31.53	23.08
Average width of ring, in inches...	.1174	.1157	.1059	.0864	.1236	.1359	.1336	.1195	.1421	.1371	.1595	.1645	.1376

Table 2 gives the average width of ring of 42 trees of 15 different species measured on the stump to hundredths of an inch and the rainfall for each year during the period from 1892 to 1904, both inclusive. These data were gathered at Agricultural College, Mich., about four miles east of Lansing and within a radius of one mile of the observation station from trees that had not suffered any radical change in environment during that time.

The small amount of rain in 1894 appears in the tree growth of the following year, and the abnormally large amount of precipitation in 1902 probably had some influence on the width of ring in 1903. The numbers, rounded off, show that a precipitation of from 30 to 35 inches in this latitude (42° 45′ 56″) gives a width of ring from 0.11 to 0.15 inch and that abnormally large or small precipitation is evidenced by the tree growth of the following year. The young leaves and long tender shoots that are put out during the early part of any season in this latitude are evidently formed from material that was stored the previous season. There is now at hand a section of a butternut stem, about four inches in diameter and four feet long, that was cut and put into storage last winter, 1904–5, that has sent out two sprouts, one five and the other ten inches long. The piece has been standing on a cement floor in a barn where no moisture was available except from the air. Piles of logs and logs of houses have often demonstrated the same thing.

In Table 1 it will be noticed that in some cases, all in the winter months, the average was less for a certain month than for the month previous. This obtains because of the frozen trees at time of measurement, the frozen stem being smaller than at zero centigrade.

We may conclude that there is a general direct relation between precipitation and tree growth.

NOTES AND EXTRACTS.

THE SCIENTIFIC STAFF OF THE WEATHER BUREAU.

Readers of the MONTHLY WEATHER REVIEW will be interested to learn that on the first of July the force of the Weather Bureau was notably increased by the appointment of (1) Prof. William J. Humphreys, of the University of Virginia, as Professor of Meteorological Physics, assigned in charge of Mount Weather Observatory; (2) Mr. James Page, of the U. S. Hydrographic Office, as Section Director in charge of the Division of Ocean Meteorology; (3) Mr. Louis G. Schultz, of the Magnetic Survey of the Argentine Republic, as Research Director, assigned in charge of the magnetic work at Mount Weather; and (4) Mr. Herbert L. Solyom, of the U. S. Patent Office, as Research Observer, temporarily assigned to the Yerkes Observatory of the University of Chicago, at Williams Bay, Wis.

In connection with these important appointments, preparatory to the research work at Mount Weather, we note also the assignment of Mr. H. H. Kimball, Librarian and Climatologist, to special work at the Astrophysical Observatory of the Smithsonian Institution, where he will conduct bolometric work during the present summer. This assignment reminds one of the analogous cases that occurred in 1883 when Messrs. McAdie, Morrill, Fassig, and McRae were sent to study electrical methods under the famous electricians at Harvard, Yale, and Johns Hopkins preparatory to the work of the service in atmospheric electricity.

These appointments respond to the current needs of the service in three different directions. Professor Humphreys brings with him the reputation of being fully up to date in all that relates to experimental physics, and his assignment to the Mount Weather Observatory gives assurance that the work at that institution will satisfy the most exacting demands.

Mr. Schultz, who has for some years been absent from the service, on furlough, first conducting magnetic work for the U. S. Coast and Geodetic Survey at Cheltenham, Md., and subsequently organizing the magnetic work of the Argentine Republic, now returns from inspecting European stations and goes to conduct similar work at Mount Weather.

Mr. Page, who has long been connected with the Hydrographic Office of the U. S. Navy Department, and has been widely known as the editor of the Pilot Chart and the author of many excellent articles relative to ocean meteorology, is now transferred to the Weather Bureau, to which the study of ocean meteorology has also been entrusted.

Eventually Mr. Solyom will do work at Mount Wilson, Cal., in atmospheric physics for comparison with similar work at Mount Weather.

These appointments, marking, as they do, the beginning of a brilliant epoch in the history of the Weather Bureau, may also be looked upon as celebrating in the most appropriate manner the tenth anniversary of the appointment of our Chief to his present position. It is very important that the service should be strengthened in the direction of physical and mathematical research; for many years it has been stated, as a criticism of the policy of the service, that we have not encouraged the ablest men in the country to take up the study of meteorology, and, therefore, those who would gladly have devoted themselves to our work have carved out for themselves brilliant careers in other branches of science, leaving meteorology alone until the Weather Bureau shall see fit to encourage them. There are, perhaps, a half dozen well known men who stand in this category, and doubtless before many years have passed some of these, or their students, will have to be set at work upon our problems.

Everyone must recognize the fact that the great desire of Prof. Willis L. Moore has been to secure harmony among the employees and enthusiastic devotion to the interests of the service; this also means devotion to the best interests of meteorology, since our knowledge of that science and our expertness in its practical applications must be increased if the work of the Weather Bureau is to retain the support, the confidence, and the affection of all classes of citizens. At the